

ture generally, and heavy rains at some of the western ports; on the 7th and 8th it passed in an irregular course centrally over Ireland and Scotland accompanied by southerly to westerly gales and heavy rains, followed over the eastern half of the Atlantic between 45° and 55° N. by northerly squalls and gales, which on the 9th spread eastward over the British Isles. No. III moved eastward north of Newfoundland on the 9th; on the morning of the 10th the weather was still unsettled at St. Johns but cleared during the day with slowly rising pressure. On the 11th the pressure increased rapidly off the coast of Newfoundland with easterly winds at St. Johns, and the area of low barometer was probably transferred to the eastern half of the ocean north of 50° N. On the 11th the barometer fell rapidly, and on the morning of the 12th a very extensive depression covered the British Isles, but with its centre at some distance to the northwest of Scotland; dull, rainy and squally weather prevailed over the British Isles, and on the coast of Norway the wind rose to a southerly gale. No. IV passed northeastward over Labrador on the 18th. No. V appeared as a large depression off the northwest coast of Ireland and Scotland on the 20th, moving toward the northeast; westerly gales were experienced westward to 15° W. No. VII probably formed in the southwest quadrant of area No. V on the 21st; on the 22nd it developed into quite a severe storm, and was encountered off the north of Ireland by steamer *Corinthian* which reported a severe gale from NE and high seas; and ship *Spartan*, when three miles northwest of Inishtrahull Light, which vessel reported "cyclone from SW. to SSE., and later from WNW.," lost entire suit of sails. S. S. *Cybele*, at Quebec, October 3rd from Glasgow, reported loss of captain "who was supposed to have been washed overboard during a violent gale on the morning of the 23rd." On this day (23rd) severe northwest gales and very high confused seas prevailed from 15° to 25° W. and from 46° N. northwards. At 7 a. m. the barometer at Stornoway read 28.37, wind SSW. light. Very heavy gales were experienced during the night of 23rd-24th along the east coast of Northumberland. No. VI moved eastward over Newfoundland on the 25th, followed by cold NW. winds, clear weather and rapidly increasing pressure on the 26th, on which day rainy and squally weather prevailed over the ocean in lat. 50° N., from 45° to 20° W. On the 27th and 28th it passed northeastward north of the British Isles, producing strong southeast to southwest gales on the British and Norwegian coasts; in England heavy rains caused much damage to crops. From the 25th to the end of the month an area of high barometer existed over Newfoundland which probably extended over the western portion of the ocean, but on the 30th an area of quite low pressure appeared over the eastern half, central in the morning probably near 20° W. 55° N., and which after having being preceded by a southerly gale on the east coast of Scotland during the night of the 30th, passed slowly eastward from Oct. 1st to 3rd, with its centre to the north of Scotland, producing westerly winds and heavy rains over the British Isles. *Pacific Ocean*.—During the months of May and June, 1879., areas of quite low pressure were observed along the China coast on the following dates:—May 17th, 23rd and 24th, 29th, June 4th and 5th, 11th to 13th, 17th to 19th and on the 30th. The probable positions of the centre of the area observed from the 17th to the 19th of June are indicated on Chart IV, but in regard to the other areas the data as yet to hand is insufficient to enable us to locate the centers. *Indian Ocean*.—On August 19th, 1879, Ship *Dunalister*, in 39° 30'S, 50° E, experienced a hurricane which lasted two days, and threw vessel on her beamends, wind WSW veering to SW, and ending S, lowest reading of barometer 29.50. *South Pacific Ocean*.—Ship *Edderside* at San Francisco, Oct. 1st, 1879 from Sydney, NSW. reports: off the coast of Australia encountered a violent hurricane, commencing at WSW. and ending at ENE., accompanied with very heavy sea, decks constantly filled with water, gale lasted eight hours. At Brisbane, NSW. a terrific hurricane uprooting large trees &c., occurred on the night of June 23rd, 1879.

TEMPERATURE OF THE AIR.

The isothermal lines upon Chart No. II show the general distribution of the temperature for the month of October, 1879, accompanying which is a table of comparative temperatures. In strong contrast with the month of September, the mean temperature of the present month over the eastern section of the country is decidedly above the average of the past eight years, ranging from 3 to 4 degrees in the Gulf States, 5 to 6.5 degrees in the Atlantic States and from 8 to 9.5 degrees in the Ohio valley, Lake region and Upper Mississippi valley. Westward of the latter the excess rapidly diminishes, being 7 degrees in the Missouri valley, and 3.3 over the middle Eastern Rocky Mountain slope. West of the Rocky Mountains it is below the normal, the deficiency ranging from 1 to 4 degrees. On the summit of Pike's Peak, Col., at an elevation of 14,150 feet, the mean temperature was 26.3, or 4.9 above the mean of the five preceding Octobers, and on the summit of Mt. Washington, at an elevation of 6,285 feet, 29.8, or 5.6 degrees above the mean of the eight preceding Octobers. The following table shows the established mean temperature of the month of October for 40 places, included within the area of high temperature, as accurately as the same can be computed from material at present in the possession of this office, with the number of years covered by the observations from which they are deduced. On comparing these means with those for the present month it is found that only four show an excess of less than 4 degrees, namely, Key West, Mobile, Norfolk and West Point. Those having an excess of 10 degrees or more occur in Ohio, Illinois, Michigan, Iowa and Minnesota. In the sixth column is given the highest maximum October temperature at each place yet published and of which this office possesses a record. On comparing these with the maxima of the present month it is seen that higher temperatures have been recorded at most stations in New England and New York during the present October than ever before, while in the other districts the previous maxima have not been exceeded, excepting at Ft. Brady and Dubuque.

PLACE OF OBSERVATION.	No. of years of observation.	Established mean.	Mean for 1879.	Difference.	Highest maximum temperature published.	Maximum in 1879.	Difference.
Fort Preble, Me.....	35	49.°1	54.°8	+ 5.°7	74°	82°	+ 8°
Gardiner, Me.....	40	46. 6	52. 5	+ 5. 9	77	80	+ 3
Portland, Me.....	46	46. 3	55. 6	+ 9. 3	77	83	+ 6
Burlington, Vt.....	39	47. 2	54. 7	+ 7. 5	—	78	—
Lunenburg, Vt.....	28	44. 5	50. 3	+ 6. 2	83	84	+ 1
Boston and Cambridge, Mass.....	96½	50. 8	56. 6	+ 5. 8	—	88	—
Fort Independence, Mass.....	36	52. 8	57. 6	+ 4. 8	83	80	- 3
Lawrence, Mass.....	23	48. 0	55. 0	+ 7. 0	75	80	+ 5
Mendon, Mass.....	46	48. 5	56. 7	+ 8. 2	84	78	- 6
New Bedford, Mass.....	67	52. 8	56. 8	+ 4. 0	83	82	- 1
Newport, R. I.....	49	53. 3	58. 4	+ 5. 1	79	81	+ 2
New Haven, Conn.....	86	51. 1	59. 0	+ 7. 9	83	83	0
Plattsburg Barracks, N. Y.....	24	46. 0	53. 6	+ 7. 5	78	74	- 4
Albany, N. Y.....	51	49. 0	56. 1	+ 7. 1	80	81	+ 1
West Point, N. Y.....	54	54. 3	58. 1	+ 3. 8	87	89	+ 2
Fort Columbus, N. Y.....	58	54. 6	61. 6	+ 6. 9	86	84	- 2
Rochester, N. Y.....	48	48. 8	57. 9	+ 9. 1	83	86	+ 3
Buffalo, N. Y.....	36	49. 1	58. 3	+ 9. 2	80	83	+ 3
Philadelphia, Pa.....	68	54. 8	61. 7	+ 6. 9	88	87	- 1
Pittsburgh, Pa.....	20	63. 1	60. 7	+ 7. 6	—	91	—
Baltimore, Md.....	44	56. 6	63. 1	+ 6. 5	89	89	0
Washington, D. C.....	50	55. 6	62. 5	+ 6. 9	90	92	+ 2
Fort Monroe, Va.....	54	61. 9	67. 4	+ 5. 5	89	85	- 4
Norfolk, Va.....	33	61. 7	64. 9	+ 3. 2	—	87	—
Charleston, S. C.....	33	65. 4	70. 6	+ 5. 2	89	87	- 2
Savannah, Ga.....	34	66. 2	70. 5	+ 4. 3	88	86	- 2
Key West.....	44	78. 7	79. 8	+ 1. 1	93	87	- 6
Mobile, Ala.....	18	65. 9	69. 7	+ 3. 8	94	90	- 4
New Orleans, La.....	41	69. 1	77. 6	+ 8. 5	90	86	- 4
Cincinnati, Ohio.....	55	53. 8	64. 8	+ 11. 0	90	86	- 4
Chicago, Ills.....	25	46. 3	60. 5	+ 11. 2	90	84	- 6
Detroit, Mich.....	38	49. 6	58. 9	+ 9. 3	86	85	- 1
Fort Brady, Mich.....	32	43. 9	54. 1	+ 10. 2	82	84	+ 2
Milwaukee, Wis.....	35	47. 8	55. 6	+ 7. 7	81	81	0
St. Louis, Mo.....	49	55. 4	62. 5	+ 7. 1	91.5	90	- 1.5
Iowa City, Iowa.....	40	48. 0	59. 1	+ 11. 1	86	86	0
Dubuque, Iowa.....	25	48. 9	59. 0	+ 10. 1	85	86	+ 1
Fort Snelling, Minn.....	42	47. 3	57. 5	+ 10. 2	90	90	0
Fort Gibson, Ind. Ter.....	35	60. 1	65. 0	+ 4. 9	95	89	- 6
Leavenworth, Kas.....	48	54. 9	62. 1	+ 7. 2	93	89	- 4

An examination of the minimum temperature shows that that temperatures, ranging from -1° to 20° , occurred during the month in the Northwest and in parts of Nebraska. The line of 40° ran westward through the northern portions of South Carolina and the Gulf States to northeastern Texas, when it bent southwestward to the Rio Grande valley. The only stations in the country above 50° are those on the Gulf coast and in Florida. The maximum temperatures throughout the country were most remarkably uniform, ranging, with few exceptions, from 80° to 90° . The extreme temperatures, except at high stations, were 72° at Roseburg, 75° at Umatilla, 77° at Wood's Holl, 95° at Fort Buford, Dak., 96° at Visalia, Los Angeles and Knoxville, and 102° at Yuma, A. T.

Minimum Temperatures.—*Maine:* 22° at *Gardiner and 26° at Eastport. *New Hampshire:* 10° at *Dunbarton. *Vermont:* 22° at *Lunenburg and 26° at Burlington. *Massachusetts:* 16° at *Westborough and 25° at Boston. *Rhode Island:* 29° at *Fort Adams and 31° at Newport. *Connecticut:* 18° at *Mystic and 24° at New Haven. *New York:* 17° at *Nile and 19° at Rochester. *Pennsylvania:* 10° at *Wellsboro and 29° at Pittsburgh. *Delaware:* 36° at *Dover. *Maryland:* 22° at *Woodstock and 30° at Baltimore. *District of Columbia:* 28° at Washington. *Virginia:* 21° at *Snowville and 28° at Lynchburg and Fort Whipple. *West Virginia:* 22° at *Helyetia and 28° at Morgantown. *North Carolina:* 22° at *Highlands and 30° at Charlotte. *South Carolina:* 36° at *Aiken and 44° at Charleston. *Georgia:* 32° at *Gainesville and 40° at Augusta. *Florida:* 45° at *Fort Barrancas and 52° at Jacksonville. *Alabama:* 43° at Montgomery. *Mississippi:* 30° at Vicksburg. *Louisiana:* 39° at Shreveport. *Texas:* 31° at McKavett. *Ohio:* 17° at *Westerville and 35° at Columbus. *Kentucky:* 36° at Louisville. *Tennessee:* 27° at Nashville. *Arkansas:* 40° at Little Rock. *Michigan:* 18° at *Hudson and 22° at Marquette. *Indiana:* 19° at *Arlington and 30° at Indianapolis. *Illinois:* 16° at *Elmira and *Geneva and 28° at Chicago. *Missouri:* 21° at *Pierce City and 32° at St. Louis. *Kansas:* 16° at *Fort Wallace and 26° at Leavenworth. *Wisconsin:* 15° at *Neillsville and 22° at La Crosse. *Iowa:* 11° at *Ames and 24° at Davenport and Dubuque. *Nebraska:* 12° at *Fort McPherson and 20° at North Platte. *Indian Territory:* 29° at Fort Gibson. *Minnesota:* 13° at Breckenridge. *Dakota:* 6° at Olivet and 10° at Bismarck. *Colorado:* 18°

at *Fort Lyon and 20° at Denver. *New Mexico*: 26° at Santa Fe. *Wyoming*: 18° at Cheyenne. *Utah*: 33° at Salt Lake City. *Nevada*: 21° at *Carson City and 23° at Winnemucca. *Arizona*: 26° at Fort Apache. *Idaho*: 8° at *Fort Hall and 25° at Boise City. *California*: 24° at Campo. *Oregon*: 17° at Umatilla.

Maximum Temperatures.—*Maine*: 85° at *West Waterville and *Orono and 83° at Portland. *New Hampshire*: 84° at *Dunbarton, *Contoocookville and *Grafton. *Vermont*: 78° at Burlington and 84° at *Lunenburg. *Massachusetts*: 90° at *Somerset and 88° at Boston. *Rhode Island*: 83° at *Fort Adams and 81° at Newport. *Connecticut*: 92° at *Mystic and 83° at New Haven and New London. *New York*: 92° at *Nile and 88° at New York City. *Pennsylvania*: 91° at Pittsburgh. *Delaware*: 83° at *Dover. *Maryland*: 89° at *Emmitsburg and Baltimore. *District of Columbia*: 92° at Washington. *Virginia*: 91° at *Mount Solon and *Accotink, and 90° at Fort Whipple. *West Virginia*: 85° at Morgantown and 86° at *Helvetia. *North Carolina*: 92° at *Weldon and 87° at Charlotte. *South Carolina*: 87° at *Aiken and Charleston. *Georgia*: 32° at *Gainesville and 89° at Augusta. *Florida*: 89° at Punta Rassa and 98° at *Houston. *Alabama*: 90° at Mobile. *Mississippi*: 90° at Vicksburg. *Louisiana*: 89° at Shreveport. *Texas*: 100° at Pilot Point. *Ohio*: 94° at *Jacksonburg and *Norwalk, and 87° at Cleveland and Sandusky. *Kentucky*: 88° at Louisville. *Tennessee*: 96° at Knoxville. *Arkansas*: 89° at Little Rock. *Michigan*: 89° at *Lausling and 87° at Marquette. *Indiana*: 90° at *New Corydon and *Logansport, and 86° at Indianapolis. *Illinois*: 90° at *Peoria, *Hinsdale and *Decatur, and 87° at Cairo. *Missouri*: 90° at St. Louis and 97° at *Booneville. *Kansas*: 84° at Leavenworth and 91° at *Fort Wallace. *Wisconsin*: 87° at *Beloit, and 84° at Madison and La Crosse. *Iowa*: 87° at Keokuk and 90° at *Guttenburg. *Nebraska*: 93° at *Fort McPherson and 89° at North Platte. *Indian Territory*: 90° at Fort Sill. *Minnesota*: 89° at Breckenridge. *Dakota*: 95° at *Morristown and Fort Buford. *Colorado*: 91° at *Fort Lyon and 84° at Denver. *New Mexico*: 92° at La Mesilla. *Wyoming*: 80° at Cheyenne. *Utah*: 82° at Salt Lake City. *Nevada*: 84° at Winnemucca and 89° at *Fort Halleck. *Arizona*: 102° at Yuma. *Idaho*: 85° at Boise City and 86° at *Fort Hall. *California*: 96° at Los Angeles. *Oregon*: 75° at Umatilla.

Ranges of Temperature at Signal-Service Stations.—The monthly ranges will appear from an examination of the maxima and minima given. The greatest daily ranges vary in New England from 21° at Wood's Holl to 26° at Eastport and 35° at Boston. Middle Atlantic States, from 21° at Cape May to 30° at Albany and 33° at Washington. South Atlantic States, from 15° Portsmouth, N. C., to 33° at Augusta. Gulf States, from 13° at Key West to 16° at New Orleans and 35° at Shreveport. Ohio valley and Tennessee, from 25° at Indianapolis to 28° at Cairo and 36° at Knoxville. Lower Lakes, from 22° at Erie to 25° at Detroit and 33° at Rochester. Upper Lakes, from 22° at Chicago to 35° at Marquette. Upper Mississippi valley, from 26° at Davenport to 32° at St. Paul. Red River of the North valley, from 45° at Pembina to 48° at Breckenridge. Lower Missouri valley, from 32° at Leavenworth to 52° at Fort Stevenson. Eastern Rocky Mountain Slope, from 32° at Denison, 43° at Fort Gibson, 48° at North Platte to 54° at Uvalde. Rocky Mountains, from 31° on Pike's Peak, 36° at Santa Fe, 34° at Virginia City to 48° at Denver. Northern and Middle Plateau districts, 31° at Pioche, 35° at Boise City to 48° at Winnemucca. California, 20° at San Francisco, 37° at Red Bluff to 43° at Los Angeles.

Frosts.—Frosts have been too numerous and frequent to permit their being enumerated in detail. In the Plateau districts frosts occurred from the 8th. At Visalia, Cal., 9th to 11th. In the extreme Northwest, from the 10th. In the Northwest, 11th and after. New England and Lake region, from the 14th; Missouri and Upper Mississippi valleys, from the 19th. Middle Atlantic States and Ohio valley, from the 20th. Tennessee, from the 24th. Virginia, 24th to 26th. Georgia, 25th. Northern Alabama, 24th and 25th. Northern half of Mississippi and Louisiana, 25th. Texas, interior, 25th and after. Pensacola, Fla., 29th, "very light."

Ice has been generally reported north of Arkansas, Tennessee and North Carolina from the 23rd. It was reported in the interior of Texas from the 24th to 27th, and Indian Territory, 24th and 25th, and at Charlotte, N. C. on 25th and 26th.

Ground Frozen.—Catawissa, Pa., 25th; Hinsdale, Ill., 31st; Oregon, Mo., 24th; Dyberry, Pa., 26th, two inches; Embarrass, Wis., 31st.

PRECIPITATION.

The general distribution of rain-fall for the month is illustrated as accurately as possible on Chart No. III, from about 500 reports; it is accompanied by a table giving the average precipitation for the month of October by districts. The rain-fall has been below the normal in all districts, excepting the South Atlantic and East Gulf States, the Lower Missouri valley, northern portions of Minnesota and Michigan and along the Pacific coast. In the Rocky Mountain region and Plateau Districts, the rain-fall has been moderate and probably about the normal amount for the month. Areas of quite small rain-fall are noticed in western Nevada, on the lee side of the Sierra Nevadas; and over portions of Colorado and Kansas, similarly situated with regard to most elevated portion of the Rocky Mountains—no rain is reported. An examination of the Chart shows extensive areas of less than one inch rain-fall covering California, and the whole western half of the Plateau Districts, the Eastern Rocky Mountain slope from Dakota to Texas, the Upper Mississippi valley from Dubuque to St. Louis, the Southwest from southern Missouri to the Gulf coast, and two large areas including portions of the Ohio valley, Lower Lake region, Middle States and New England. Severe draughts are reported in all these sections, and throughout the country generally, rivers and springs are reported very low. These will be noted in detail under their respective headings.

Those marked with * are voluntary reports.